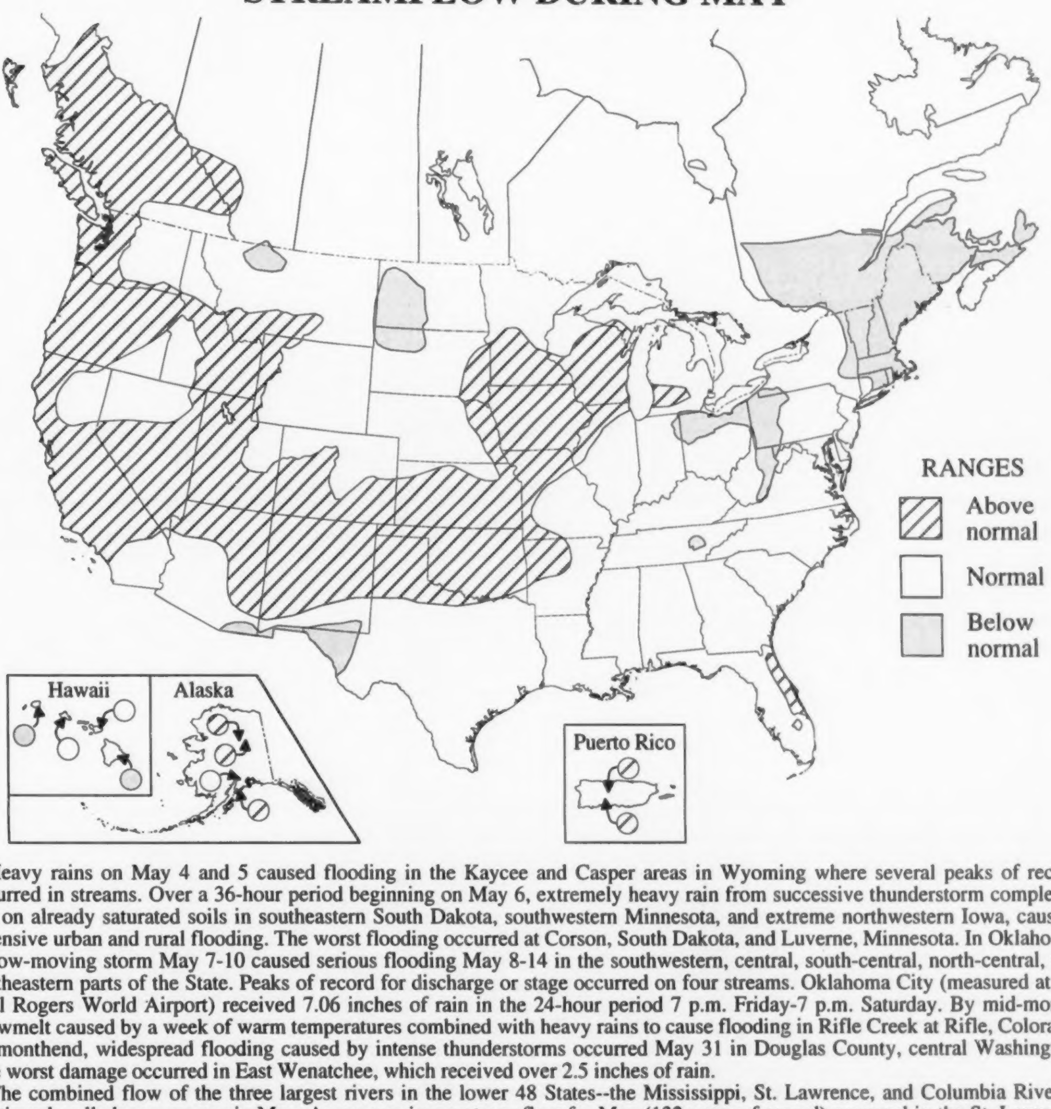
National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

MAY 1993

STREAMFLOW DURING MAY



Heavy rains on May 4 and 5 caused flooding in the Kaycee and Casper areas in Wyoming where several peaks of record occurred in streams. Over a 36-hour period beginning on May 6, extremely heavy rain from successive thunderstorm complexes fell on already saturated soils in southeastern South Dakota, southwestern Minnesota, and extreme northwestern Iowa, causing extensive urban and rural flooding. The worst flooding occurred at Corson, South Dakota, and Luverne, Minnesota. In Oklahoma, a slow-moving storm May 7-10 caused serious flooding May 8-14 in the southwestern, central, south-central, north-central, and northeastern parts of the State. Peaks of record for discharge or stage occurred on four streams. Oklahoma City (measured at the Will Rogers World Airport) received 7.06 inches of rain in the 24-hour period 7 p.m. Friday-7 p.m. Saturday. By mid-month, snowmelt caused by a week of warm temperatures combined with heavy rains to cause flooding in Rifle Creek at Rifle, Colorado. At monthend, widespread flooding caused by intense thunderstorms occurred May 31 in Douglas County, central Washington. The worst damage occurred in East Wenatchee, which received over 2.5 inches of rain.

The combined flow of the three largest rivers in the lower 48 States--the Mississippi, St. Lawrence, and Columbia Rivers--continued well above average in May. A new maximum streamflow for May (132 years of record) occurred in the St. Lawrence River at Cornwall, Ontario, Canada, near Messina, New York, where the 353,000 cfs surpassed the previous record of 336,700 cfs (May 1973).

In Nevada, the level of Lake Tahoe (California-Nevada border) exceeded its natural rim on May 27, flowing to the Truckee River for the first time since Spetember 15, 1990. Six other reservoirs in northern Nevada were at 2/3 or greater capacity at monthend. In Kansas, record-high water levels were measured in six reservoirs: El Dorado, John Redmond, Clinton, Pomona, Council Grove, and Marion.

Mean May elevations at the four master gages on the Great Lakes (National Ocean Service provisional data) were in the normal range on Lakes Superior and Huron and in the above-normal range on Lakes Erie and Ontario; the Lake Erie gage measured a decline in elevation from that for April. The level of the Great Salt Lake in Utah continued to rise seasonally.

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SURFACE-WATER CONDITIONS DURING MAY 1993

Heavy rains on May 4 and 5 in the Kaycee, **Wyoming**, area produced a peak discharge of about 11,000 cubic feet per second (cfs) at gaging station Powder River at Sussex, the largest peak since 1978. Peaks-of-record flows were recorded from the same storm at two Smith Creek stations in the Casper area on May 5.

Over a 36-hour period beginning in the afternoon of May 6, extremely heavy rain from successive thunderstorm complexes fell on already saturated soils in southeastern **South Dakota**, southwestern **Minnesota**, and extreme northwestern **Iowa**. The heavy rains caused urban and rural flooding as well as many road closings throughout the area. In addition to the heavy rains, hail, damaging straight-line winds, and at least five tornadoes were reported. In Brookings, South Dakota, 126-mph winds damaged trailer homes and apartments, injuring 12 people. Near Baltic, South Dakota, strong winds were blamed for a traffic accident that killed one person. Rainfall amounts ranged from 9 inches near Marshall, Minnesota, 6 inches at Canistota, South Dakota, to 4.65 inches at Brandon, South Dakota.

The most severe flooding occurred in Split Rock Creek at Corson, South Dakota, and Rock River at Luverne, Minnesota, where peak discharges equalled those of the 100-year flood, and both peak stages and discharges exceeded those of record. Peak stage and discharge also exceeded those of record in Beaver Creek at Valley Springs, South Dakota; the peak discharge had a recurrence interval of 70 years. Peak discharges were only in the 20-25 year recurrence-interval range, but peak stages or discharges exceeded those of record at stations West Fork Vermillion River near Parker, South Dakota, Chanarambie Creek near Edgerton, Minnesota, and Big Sioux River at Akron, Iowa.

Heavy rains from a slow-moving storm May 7-10 caused serious flooding May 8-14 in southwestern, central, south-central, north-central, and northeastern **Oklahoma**. Oklahoma City (measured at the Will Rogers World Airport) received 7.06 inches of rain in the 24 hours between 7 p.m. Friday, May 7 and 7 p.m. Saturday, May 8. In South Oklahoma City, especially along Lightning and Brock Creeks where flooding claimed four lives, the damage was the worst in 32 years and is estimated to exceed $1 million. Statewide, over 2,000 homes were damaged, of which more than 900 were in Oklahoma County. More than 60 bridges were heavily damaged or destroyed by the floodwaters, 50 in Payne County alone. Damage to roads and bridges is expected to exceed $10 million. As of May 15, 13 counties had been declared eligible for Federal disaster relief—Oklahoma, Kingfisher, Logan, Payne, Bryan, Canadian, Carter, Cleveland, Grady, Kay, Pottawatomie, Tulsa, and Washington. Agricultural relief had been requested for 32 counties where the wheat crop was damaged or destroyed on over 5 million acres of farmland.

Peaks of record for discharge or stage occurred on four streams: Peak discharge at station Arkansas River near Ponca City exceeded that of the 100-year flood; peak discharges and stages at stations Cimarron River near Ripley and North Canadian River near Calumet exceeded those of record, the peak discharges being in the 50-year recurrence interval; and the peak stage at station Chikaskia River near Blackwell exceeded that of record by about 1 foot. Peak discharges in the North Fork Red River near Headrick (recurrence interval 100 years) and at Tipton (recurrence interval 50 years) as well as Washita River at Anadarko (recurrence interval 50 years) did not exceed peaks of record on either stream.

On May 16, heavy rains and snowmelt caused flooding in Rifle Creek at Rifle, **Colorado**. The spring runoff began after a week of warm temperatures. Flows were higher than they had been for several years, and high snowpack still remains in the mountains.

At monthend, a series of intense thunderstorms over Douglas County in central **Washington** caused widespread flooding May 31 along small streams. The most serious damage occurred in East Wenatchee, which received over 2.5 inches of rain on the afternoon of the 31st, along Sand Creek. Damages to the roads and about 100 homes are estimated to be about $250,000 to the homes and $100,000 to the roads. In Waterville on the north side of Badger Mountain, rainfall intensities of over 0.5 inch per hour were reported.

Five new extremes—all maximums—occurred during May. Hydrographs for three of the streamflow stations at which these extremes occurred are on page 3 and another is on page 5.

Flows in the Truckee, Walker, Carson, and Humbolt Rivers in Nevada averaged 100 percent to 150 percent of the long-term mean while monthly mean discharges at seven index stream-gaging stations in Utah averaged 170 percent of normal for the period of record. The combined flow of the three largest rivers in the lower 48 States—the Mississippi, St. Lawrence, and Columbia Rivers—continued well above average in May. A new maximum streamflow for May (132 years of record) occurred in the St. Lawrence River at Cornwall, Ontario, Canada, near Messina, New York, where the 353,000 cfs surpassed the previous record of 336,700 cfs that occurred in May 1973.

Monthend reservoir contents were in the above-average range at 49 of the 100 reporting reservoirs and in the below-average range at 21 (see table on page 8). The level of Lake Tahoe on the California-Nevada border exceeded its natural rim on May 27, flowing to the Truckee River for the first time since September 15, 1990. In Kansas, the record-high water levels in six reservoirs—El Dorado, John Redmond, Clinton, Pomona, Council Grove, and Marion—are indicative of the continuing wet conditions in the Midwest.

Mean May elevations at the four master gages on the Great Lakes (graphs on page 9) were in the normal range on Lakes Superior and Huron and in the above-normal range on Lakes Erie and Ontario (National Ocean Service provisional data). Levels fell from those for April only on Lake Erie. The level of Utah's Great Salt Lake (graph on page 9) continued to rise seasonally.

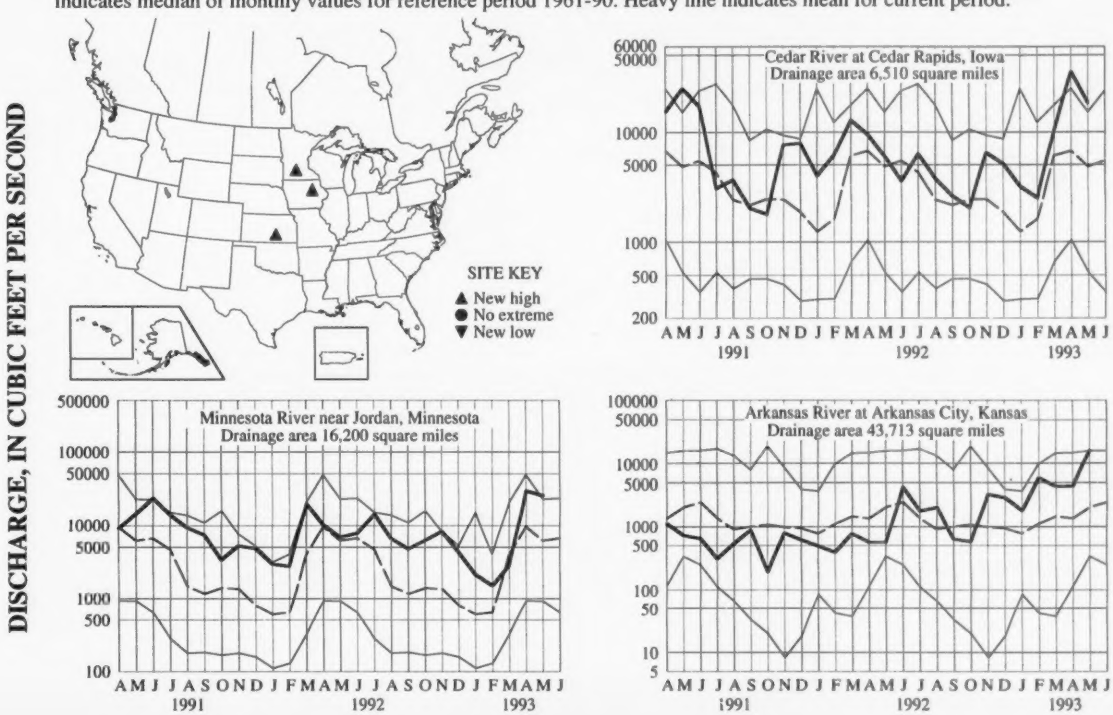
Provisional data; subject to revision

NEW MAXIMUMS DURING MAY 1993 AT STREAMFLOW INDEX STATIONS

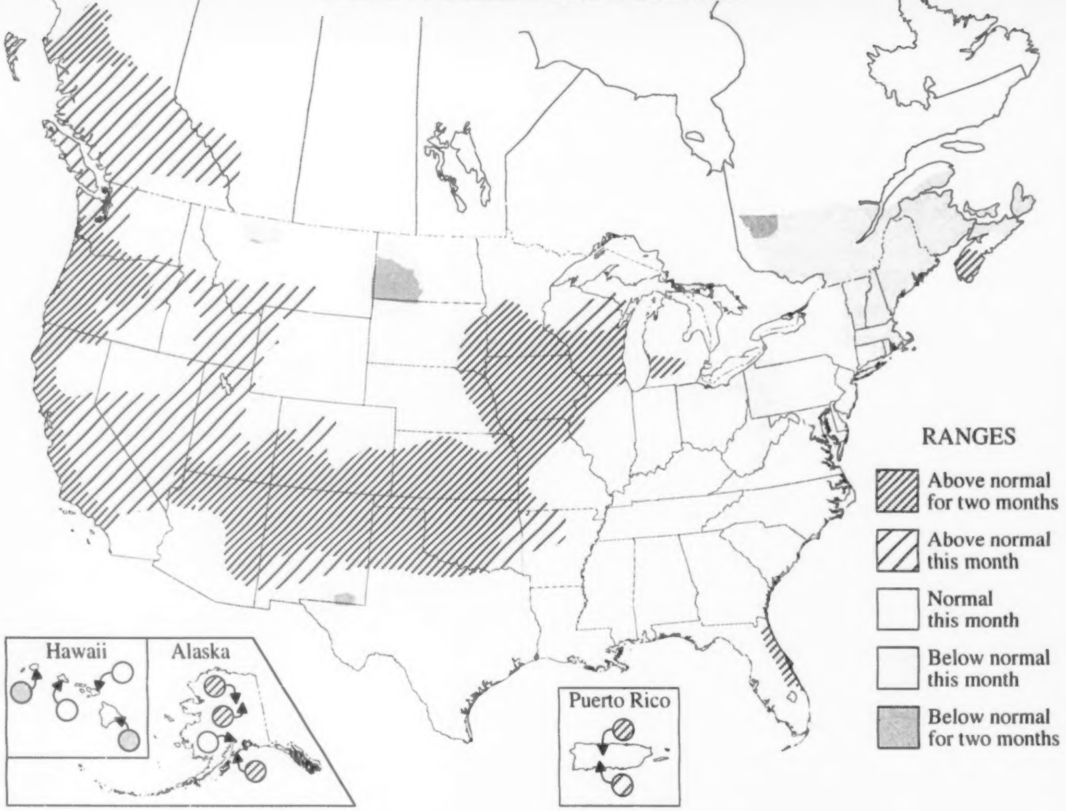
Station number	Stream and place of determination	Drainage area (square miles)	Previous May maximums (period of record): Years of record	Monthly mean in cfs (year)	Daily mean in cfs (year)	May 1993: Monthly mean in cfs	Percent of median	Daily mean in cfs	Day
04264331	St. Lawrence River at Cornwall, Ontario, near Massena, New York	298,800	132	336,700 (1973)	345,000 (1973)	353,000	124	378,000	20
05330000	Minnesota River near Jordan, Minnesota	16,200	58	23,030 (1986)	36,600 (1986)	25,640	417	41,000	15
05464500	Cedar River at Cedar Rapids, Iowa	6,510	90	15,080 (1983)	52,450 (1903)	18,310	381	31,700	8
05480500	Des Moines River at Fort Dodge, Iowa	4,190	60	9,985 (1984)	19,300 (1984)	10,460	464	15,300	12
07146500	Arkansas River at Arkansas City, Kansas	43,713	75	15,850 (1951)	60,400 (1951)	16,060	775	74,100	11

MONTHLY MEAN DISCHARGE OF SELECTED STREAMS

Area between light-weight solid lines indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period 1961-90. Heavy line indicates mean for current period.



MAY 1993 STREAMFLOW RANGES



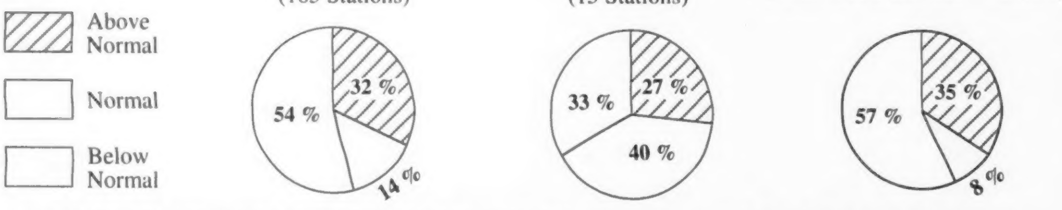
SUMMARY OF MAY 1993 STREAMFLOW RANGES

By Conditions at Individual Index Stations

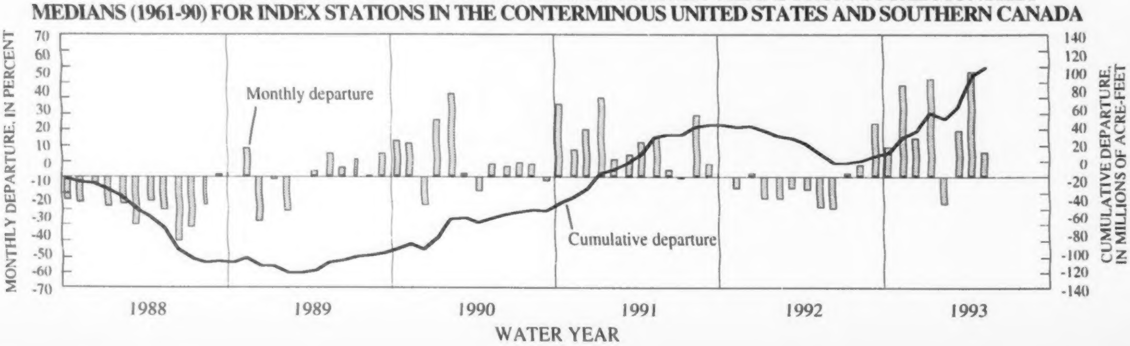
Conterminous United States (165 Stations)

Southern Canada (15 Stations)

By Total Area Conterminous United States and southern Canada (Area=3,675,000 mi^2 – revised)

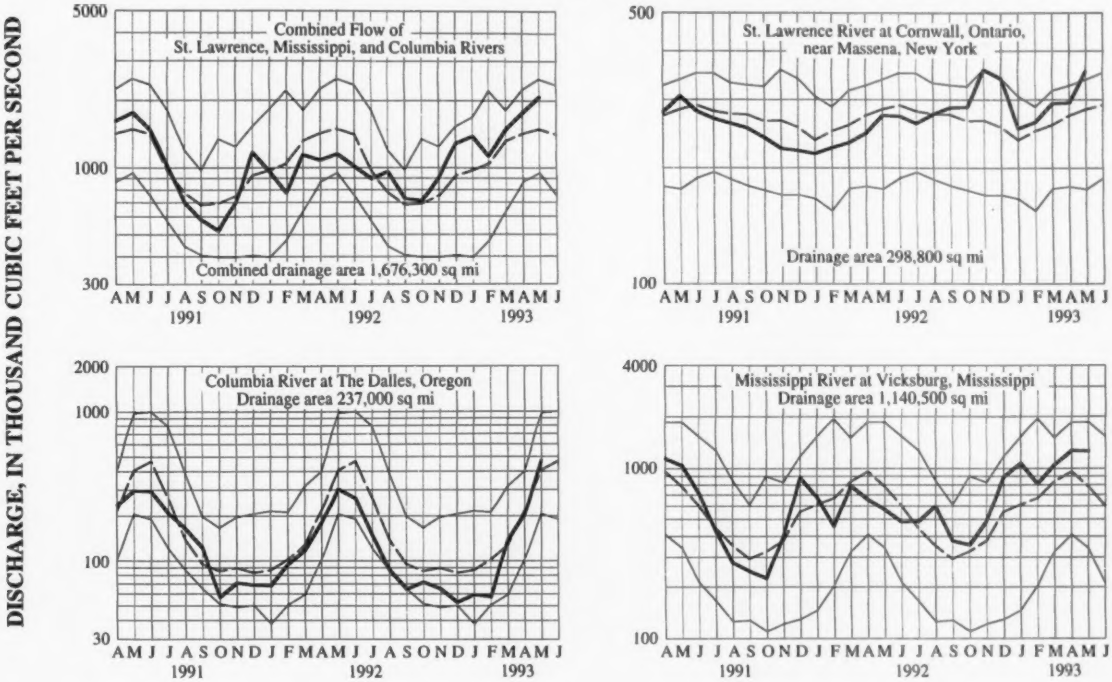


MONTHLY AND CUMULATIVE DEPARTURE OF TOTAL MONTHLY MEANS FROM TOTAL MONTHLY MEDIANS (1961-90) FOR INDEX STATIONS IN THE CONTERMINOUS UNITED STATES AND SOUTHERN CANADA



HYDROGRAPHS FOR THE "BIG THREE" RIVERS

Area between light-weight solid lines indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period 1961-90. Heavy line indicates mean for current period.



Provisional data; subject to revision

DISSOLVED SOLIDS AND WATER TEMPERATURES FOR MAY 1993 AT DOWNSTREAM SITES ON FOUR LARGE RIVERS

Station number	Station name	May data of following calendar years	Stream discharge during month	Dissolved-solids concentration [1]		Dissolved-solids discharge [1]			Water temperature [2]		
			Mean (ft³/s)	Minimum (mg/L)	Maximum (mg/L)	Mean (tons per day)	Minimum (tons per day)	Maximum (tons per day)	Mean (°C)	Minimum (°C)	Maximum (°C)
01463500	Delaware River at Trenton, New Jersey, (Morrisville, Pennsylvania)	1993	11,170	87	135	2,814	1,600	4,955	18.0	13.5	21.5
		1945-92	15,500	50	123	[3]3,613	930	21,800	[3]17.0	10.0	28.5
		(Extreme yr)		(1946)	(1978)		(1965)	(1984)			
			[4]13,640								
07289000	Mississippi River at Vicksburg, Mississippi	1993	1,258,000	228	249	807,870	728,120	894,320	21.5	17.5	23.5
		1976-92	817,700	178	295	479,000	176,000	954,000	20.5	14.5	27.0
		(Extreme yr)		(1977)	(1987)		(1977)	(1983)			
			[4]778,800								
06934500	Missouri River at Hermann, Missouri. (60 miles west of St. Louis, Missouri)	1993	187,000	271	337	151,900	101,000	236,000	19.5	17.0	24.0
		1976-92	118,200	177	520	109,400	41,400	276,000	19.5	13.0	25.0
		(Extreme yr)		(1990)	(1981)		(1989)	(1990)			
			[4]105,100								
14128910	Columbia River at Beaver Army Terminal, Oregon (streamflow station at The Dalles, Oregon)	1993	389,000	69	85	83,300	62,600	107,800	13.5	9.5	16.5
		1976-92	251,400	67	144	64,300	33,300	102,000	12.5	9.5	16.5
				(1976)	(1977)		(1990)	(1983)			
			[4]406,100								

[1]Dissolved-solids concentrations, when not analyzed directly, are calculated on basis of measurements of specific conductance.
[2]To convert °C to °F: [(1.8 x °C) + 32] = °F.
[3]Mean for 8-year period (1983-91).
[4]Median of monthly values for 30-year reference period, water years 1961-90, for comparison with data for current month.

Provisional data; subject to revision

FLOW OF LARGE RIVERS DURING MAY 1993

				May 1993					
							Discharge near end of month		
Station number	Stream and place of determination	Drainage area (square miles)	Average discharge through September 1991 (cubic feet per second)	Monthly mean discharge (cubic feet per second)	Percent of median monthly discharge 1961–90	Change in discharge from previous month (percent)	Cubic feet per second	Million gallons per day	Date
01014000	St. John River below Fish River at Fort Kent, Maine	5,665	9,693	† 16,630	50	–54	15,300	9,890	31
01318500	Hudson River at Hadley, New York	1,664	2,925	3,840	77	–73	2,040	1,320	31
01357500	Mohawk River at Cohoes, New York	3,456	5,673	† 3,660	57	–89	1,790	1,160	31
01463500	Delaware River at Trenton, New Jersey	6,780	11,660	11,170	82	–77	4,460	2,880	31
01570500	Susquehanna River at Harrisburg, Pennsylvania	24,100	34,200	37,480	92	–83	12,200	7,890	31
01646500	Potomac River near Washington, District of Columbia	11,560	[1]11,070	[1]13,200	88	–77	...	...	...
02105500	Cape Fear River at William O. Huske Lock, near Tarheel, North Carolina.	4,852	4,933	2,532	76	–86	...	...	...
02131000	Pee Dee River at Peedee, South Carolina	8,830	9,903	11,630	130	–61	10,200	6,590	31
02226000	Altamaha River at Doctortown, Georgia	13,600	13,570	9,895	82	–78	7,200	4,650	31
02320500	Suwannee River at Branford, Florida	7,880	7,038	6,193	93	–62	4,150	2,680	31
02358000	Apalachicola River at Chattahoochee, Florida	17,200	22,137	19,700	107	–47	16,800	10,900	31
02467000	Tombigbee River at Demopolis lock and dam, near Coatopa, Alabama.	15,385	23,700	27,720	120	–21	17,200	11,100	31
02489500	Pearl River near Bogalusa, Louisiana	6,573	10,102	10,130	93	–55	5,030	3,250	31
03049500	Allegheny River at Natrona, Pennsylvania	11,410	[1]19,690	† [1]12,430	59	–76	5,590	3,610	31
03085000	Monongahela River at Braddock, Pennsylvania	7,337	[1]12,540	† [1]5,885	39	–78	3,040	1,960	31
03193000	Kanawha River at Kanawha Falls, West Virginia	8,367	12,550	11,800	78	–48	8,730	5,640	25
03234500	Scioto River at Higby, Ohio	5,131	4,654	3,780	71	–67	2,040	1,320	31
03294500	Ohio River at Louisville, Kentucky[2] #	91,170	115,900	104,000	76	–60	67,300	43,500	31
03377500	Wabash River at Mount Carmel, Illinois	28,635	27,880	39,870	104	–43	19,800	12,800	31
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wisconsin[2]	6,010	4,248	* 13,000	255	5	8,050	5,200	31
04264331	St. Lawrence River at Cornwall, Ontario, near Massena, New York[3] #	298,800	245,300	* 353,000	125	20	350,000	226,000	31
02NG001	St. Maurice River at Grand Mere, Quebec	16,300	[1]24,290	...	...	...	...	...	...
05082500	Red River of the North at Grand Forks, North Dakota	30,100	2,565	3,210	81	–74	2,680	1,730	31
05133500	Rainy River at Manitou Rapids, Minnesota	19,400	9,036	13,650	67	19	13,500	8,730	31
05330000	Minnesota River near Jordan, Minnesota	16,200	7,062	* 25,640	417	–14	17,100	11,000	31
05331000	Mississippi River at St. Paul, Minnesota#	36,800	[1]15,890	* [1]43,610	197	–11	33,700	21,800	31
05365500	Chippewa River at Chippewa Falls, Wisconsin	5,650	5,072	9,200	141	–7	9,400	6,080	31
05407000	Wisconsin River at Muscoda, Wisconsin	10,400	8,666	* 20,100	179	–19	...	...	...
05446500	Rock River near Joslin, Illinois	9,549	6,161	* 18,140	230	–34	11,800	7,630	31
05474500	Mississippi River at Keokuk, Iowa#	119,000	64,070	* 217,700	211	–13	154,000	99,500	31
06214500	Yellowstone River at Billings, Montana	11,795	6,965	* 19,800	156	562	29,000	18,700	31
06934500	Missouri River at Hermann, Missouri#	524,200	76,940	* 187,000	178	–2	151,000	97,600	31
07289000	Mississippi River at Vicksburg, Mississippi[4] #	1,140,500	583,000	* 1,258,000	162	–1	1,130,000	730,000	28
07331000	Washita River near Dickson, Oklahoma	7,202	1,584	* 20,180	1,199	214	14,400	9,310	27
08276500	Rio Grande below Taos Junction Bridge, near Taos, New Mexico.	9,730	757	* 2,625	231	132	4,300	2,780	31
09315000	Green River at Green River, Utah	44,850	6,292	14,530	126	200	...	...	...
11425500	Sacramento River at Verona, California	21,251	18,810	18,800	149	–52	...	...	...
13269000	Snake River at Weiser, Idaho	69,200	18,220	25,600	111	5	20,200	13,100	31
13317000	Salmon River at White Bird, Idaho	13,550	11,160	* 38,900	128	346	46,300	29,900	31
13342500	Clearwater River at Spalding, Idaho	9,570	15,290	52,200	111	121	37,400	24,200	31
14105700	Columbia River at The Dalles, Oregon[5] #	237,000	[1]192,200	[1]471,800	116	132	282,000	182,000	31
14191000	Willamette River at Salem, Oregon	7,280	[1]23,400	* [1]33,160	158	–36	27,900	18,000	31
15515500	Tanana River at Nenana, Alaska	25,600	24,200	* 47,800	165	199	46,000	29,700	31
08MF005	Fraser River at Hope, British Columbia	83,800	95,720	199,100	111	217	2,130,000	1,380,000	31

#Indicates stations excluded from the combination bar/line graph. See Explanation of Data.

[1]Adjusted.

[2]Records furnished by Corps of Engineers.

[3]Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y., when adjusted for storage in Lake St. Lawrence.

[4]Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.

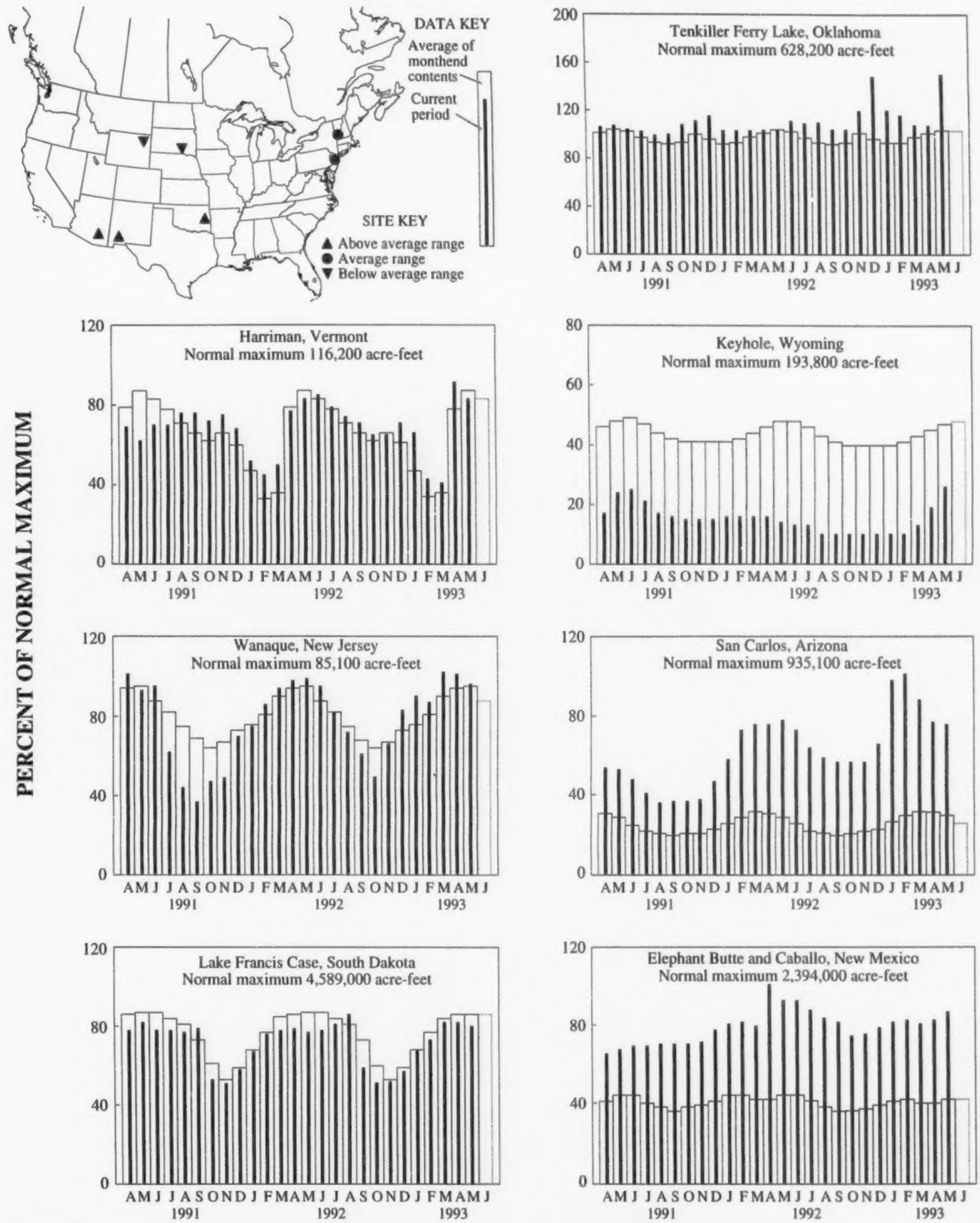
[5]Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

* Above-normal range

† Below–normal range

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF MAY 1993

[Contents are expressed in percent of reservoir (system) capacity. The usable capacity of each reservoir (system) is shown in the column headed "Normal maximum" in the table Usable contents of selected reservoir systems.]



Provisional data; subject to revision

USABLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS NEAR END OF MAY 1993

[Contents are expressed in percent of reservoir or reservoir system capacity. The usable capacity of each reservoir or reservoir system is shown in the column headed "Normal maximum"]

Reservoir or reservoir system Principal uses: F-Flood control I-Irrigation M-Municipal P-Power R-Recreation W-Industrial	Percent of normal maximum End of May 1993	 End of May 1992	 Average for end of May	 End of April 1993	Normal maximum (acre-feet)[1]
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook reservoirs (P)	† 70	60	78	68	[2]226,300
QUEBEC					
Allard (P)	† 57	79	88	73	280,600
Gouin (P)	* 73	63	65	62	6,954,000
MAINE					
Seven reservoir systems (MP)	89	90	90	92	4,146,000
NEW HAMPSHIRE					
First Connecticut Lake (P)	* 94	90	88	86	76,450
Lake Francis (FPR)	* 95	93	83	92	99,310
Lake Winnipesaukee (PR)	† 87	89	101	94	165,700
VERMONT					
Harriman (P)	83	83	87	91	116,200
Somerset (P)	84	84	86	93	57,390
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	87	94	90	88	77,920
NEW YORK					
Great Sacandaga Lake (FPR)	97	101	97	106	786,700
Indian Lake (FMP)	† 95	96	103	108	103,300
New York City reservoir system (MW)	† 96	88	100	101	1,680,000
NEW JERSEY					
Wanaque (M)	96	99	95	101	85,100
PENNSYLVANIA					
Allegheny (FPR)	49	49	48	52	1,180,000
Pymatuning (FMR)	99	100	99	94	188,000
Raystown Lake (FR)	68	68	64	70	761,900
Lake Wallenpaupack (PR)	83	90	80	82	157,800
MARYLAND					
Baltimore Municipal System (M)	* 100	77	94	101	61,900
NORTH CAROLINA					
Bridgewater (Lake James) (P)	* 99	96	93	99	288,800
Narrows (Badin Lake) (P)	96	95	99	96	128,900
High Rock Lake (P)	83	82	83	93	234,800
SOUTH CAROLINA					
Lake Murray (P)	* 94	94	85	92	1,614,000
Lake Marion and Lake Moultrie (P)	* 89	85	79	86	1,777,000
SOUTH CAROLINA-GEORGIA					
Strom Thurmond Lake (FP)	* 82	75	75	77	1,730,000
GEORGIA					
Burton Lake (PR)	98	98	94	98	104,000
Sinclair (MPR)	93	90	92	92	214,000
Lake Sidney Lanier (FMPR)	65	62	65	65	1,686,000
ALABAMA					
Lake Martin (P)	99	99	95	98	1,375,000
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	* 75	67	66	71	2,293,000
Douglas Lake (FPR)	* 82	82	72	75	1,395,000
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	* 92	89	83	87	1,012,000
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	* 88	82	72	82	2,880,000
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	* 94	79	83	84	1,478,000
WISCONSIN					
Chippewa and Flambeau (PR)	* 96	92	87	77	365,000
Wisconsin River (21 reservoirs) (PR)	85	90	82	67	399,000
MINNESOTA					
Mississippi River Headwater System (FMR)	* 44	38	37	37	1,640,000
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	† 63	61	81	60	22,700,000
SOUTH DAKOTA					
Angostura (I)	* 91	77	85	99	130,770
Belle Fourche (I)	† 56	36	73	50	185,200
Lake Francis Case (FIP)	† 80	77	86	82	4,589,000
Lake Oahe (FIP)	75	64	75	72	22,240,000
Lake Sharpe (FIP)	102	102	102	102	1,697,000
Lewis and Clark Lake (FIP)	88	88	92	86	432,000
NEBRASKA					
Lake McConaughy (IP)	† 67	59	80	66	1,948,000
OKLAHOMA					
Eufaula Lake (FPR)	* 144	100	99	99	2,378,000
Keystone Lake (FPR)	* 208	82	106	89	661,000
Tenkiller Ferry Lake (FPR)	* 150	104	104	107	628,200
Lake Altus (FIMR)	* 100	100	69	102	133,000
Lake O'The Cherokees (FPR)	* 122	98	94	102	1,492,000
OKLAHOMA-TEXAS					
Lake Texoma (FMPRW)	* 139	103	104	96	2,722,000
TEXAS					
Bridgeport (IMW)	* 97	97	59	97	386,400
Canyon Lake (FMR)	* 99	121	86	98	385,600
International Amistad (FIMPW)	* 92	99	81	98	3,497,000
International Falcon (FIMPW)	60	103	65	71	2,668,000
Livingston (IMW)	* 101	104	94	101	1,788,000
Possum Kingdom Lake (IMPRW)	93	93	96	94	570,200
Red Bluff (P)	* 42	40	28	45	307,000
Toledo Bend (P)	95	97	94	98	4,472,000
Twin Buttes (FIM)	* 75	78	37	77	177,800
Lake Kemp (IMW)	* 103	94	90	96	268,000
Lake Meredith (FMW)	38	37	36	38	796,900
Lake Travis (FIMPRW)	* 97	104	85	97	1,144,000
MONTANA					
Canyon Ferry Lake (FIMPR)	* 89	73	79	75	2,043,000
Fort Peck Lake (FPR)	† 59	59	84	57	18,910,000
Hungry Horse (FIPR)	† 49	77	73	26	3,451,000
WASHINGTON					
Ross (PR)	* 74	69	58	24	1,052,000
Franklin D. Roosevelt Lake (IP)	* 98	73	72	92	5,022,000
Lake Chelan (PR)	* 91	69	73	31	676,100
Lake Cushman (PR)	* 101	98	94	88	359,500
Lake Merwin (P)	105	103	104	99	245,600
IDAHO					
Boise River (4 reservoirs) (FIP)	81	35	78	60	1,235,000
Coeur d'Alene Lake (P)	† 96	97	123	103	238,500
Pend Oreille Lake (FP)	* 90	76	80	52	1,561,000
IDAHO-WYOMING					
Upper Snake River (8 reservoirs) (MP)	* 89	65	78	64	4,401,000
WYOMING					
Boysen (FIP)	* 85	68	67	76	802,000
Buffalo Bill (IP)	* 89	72	73	64	646,600
Keyhole (F)	† 26	14	47	19	193,800
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey reservoirs (I)	† 45	44	61	36	3,056,000
COLORADO					
John Martin (FIR)	20	14	21	24	364,400
Taylor Park (IR)	† 51	72	70	61	106,200
Colorado-Big Thompson Project (I)	63	61	64	56	730,300
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa reservoirs (IFPR)	71	65	76	61	31,620,000
UTAH-IDAHO					
Bear Lake (IPR)	† 30	33	69	22	1,421,000
CALIFORNIA					
Folsom Lake (FIMPR)	* 95	68	85	83	1,000,000
Hetch Hetchy (MP)	† 60	65	69	23	360,400
Lake Isabella (FIR)	* 59	27	46	38	568,100
Pine Flat Lake (FIR)	* 75	35	69	57	1,001,000
Clair Engle Lake (Lewiston) (FP)	† 68	47	87	57	2,438,000
Lake Almanor (P)	* 93	83	69	83	1,036,000
Lake Berryessa (FIMRW)	† 58	37	83	59	1,600,000
Millerton Lake (FI)	* 85	90	77	75	503,200
Shasta Lake (FIPR)	* 100	60	88	96	4,377,000
CALIFORNIA-NEVADA					
Lake Tahoe (IMPRW)	† 0	0	66	0	744,600
NEVADA					
Rye Patch (I)	† 16	1	60	13	194,300
ARIZONA-NEVADA					
Lake Mead and Lake Mohave (FIMP)	* 83	77	73	84	27,970,000
ARIZONA					
San Carlos (IP)	* 76	78	30	77	935,100
Salt and Verde River System (IMPR)	* 84	85	56	89	2,019,100
NEW MEXICO					
Conchas (FIR)	86	94	82	87	315,700
Elephant Butte and Caballo (FIPR)	* 87	93	43	83	2,394,000

[1] 1 acre-foot = 0.04356 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second per day.

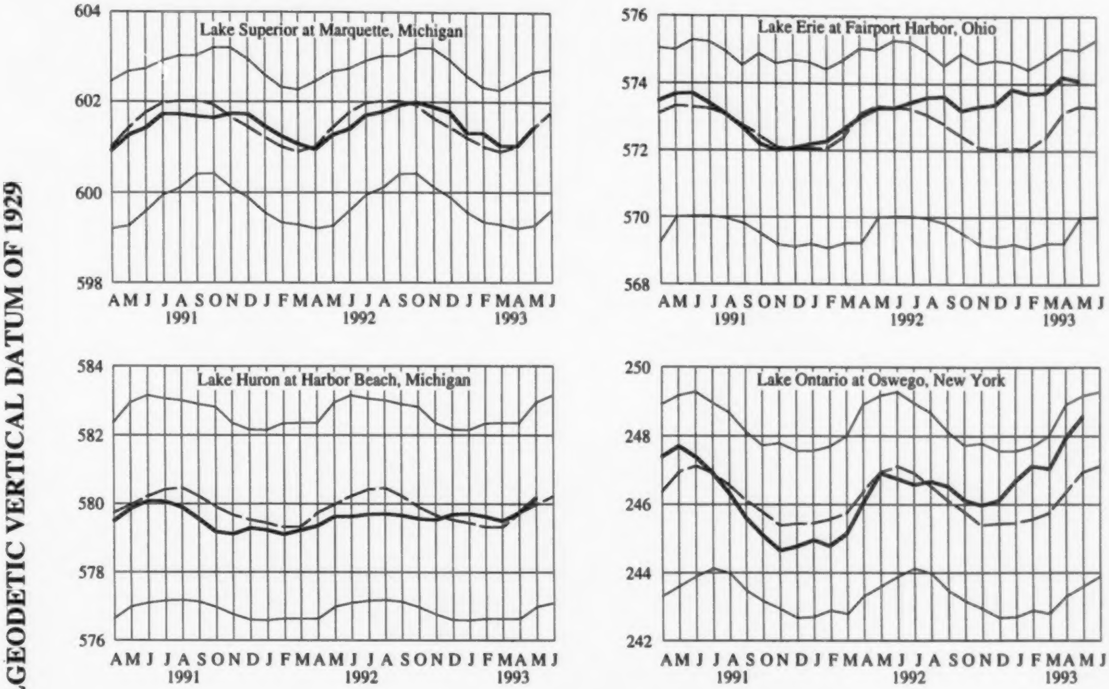
[2] Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

* Above-average range

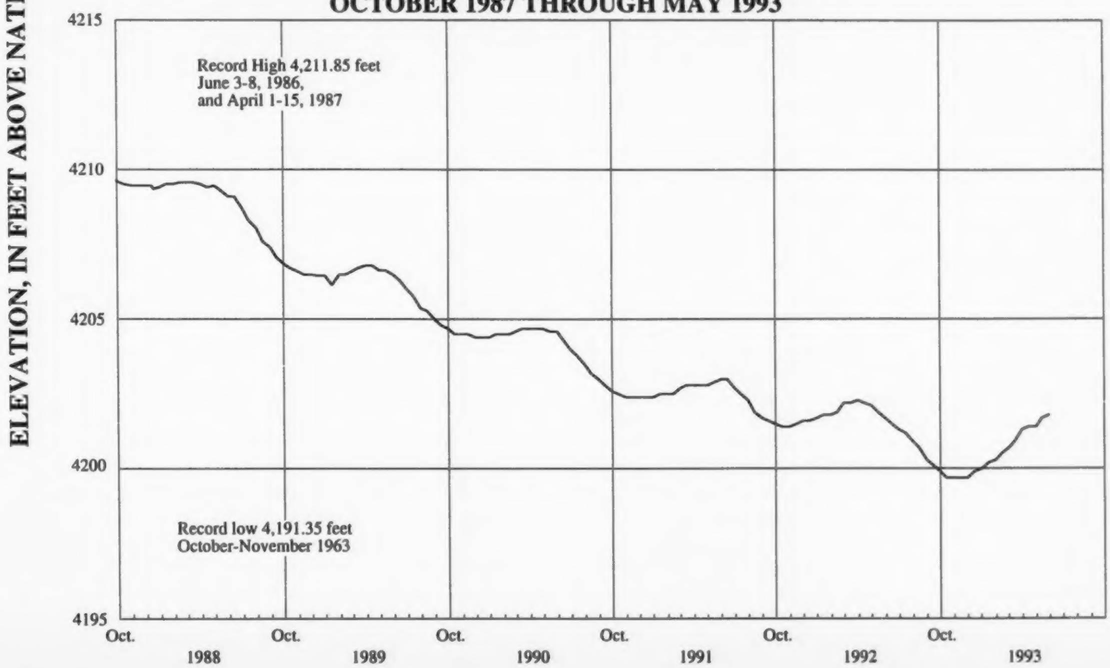
† Below-average range

GREAT LAKES ELEVATIONS

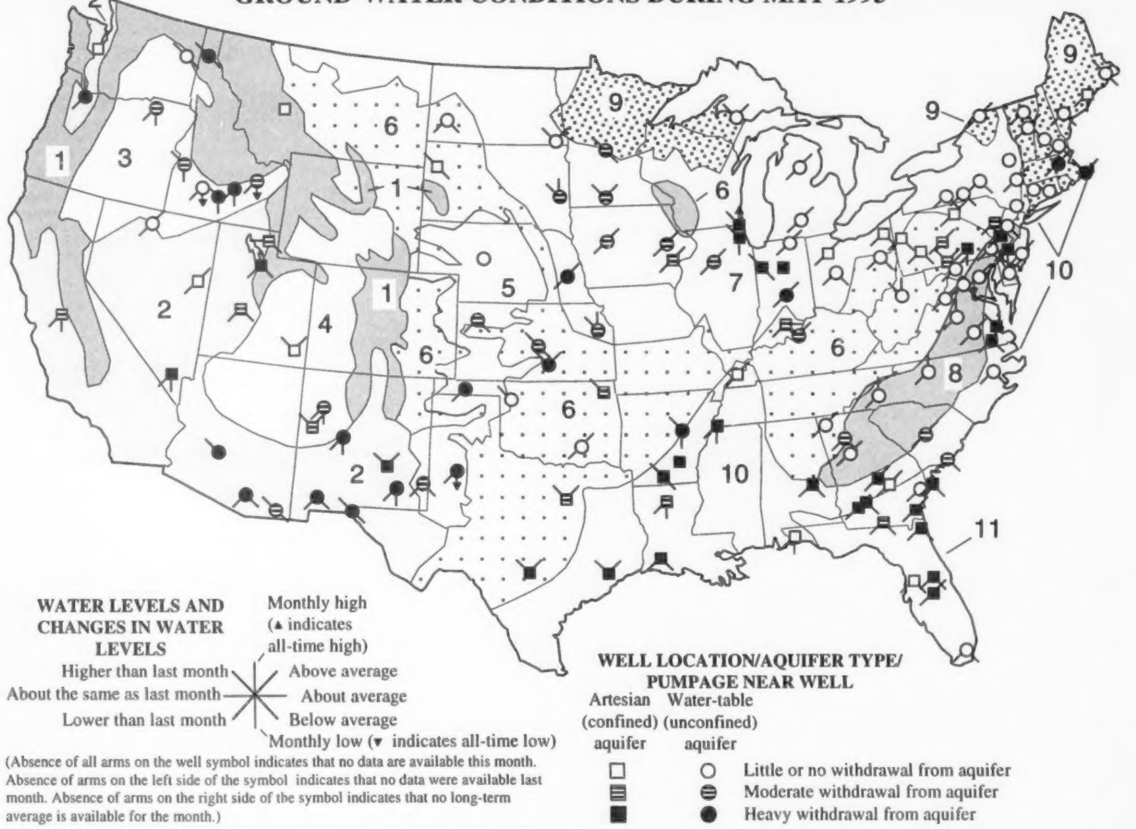
Area between light-weight solid lines indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period 1961-90. Heavy line indicates mean for current period. Data from National Ocean Service.



FLUCTUATIONS OF THE GREAT SALT LAKE, OCTOBER 1987 THROUGH MAY 1993



GROUND-WATER CONDITIONS DURING MAY 1993



New extremes occurred at 30 ground-water index stations (see table on page 12) during May—22 lows (including 3 all-time) and 8 highs (including 1 all-time)—compared with 34 new extremes last month. Graphs showing water levels in seven wells for the past 26 months are on page 13. Two of the graphs are for wells in the Glaciated Central region; one in North Dakota and one in Kansas (a May high). One graph is for a well in the Western Mountain Ranges region (Idaho), one graph is for a well in the Alluvial Basins region (a May low in New Mexico), one graph is for a well in the Nonglaciated Central region (a May high in West Virginia), one graph is for a well in the Southeast Coastal Plain (Florida), and one graph is for a well in the Northeast and Superior Uplands region (a May low in Maine).

Ground-water levels in the Western Mountain Ranges region were above last month's levels, but below long-term average throughout the region. The Cretaceous aquifer well near Helena, Montana, did not set a monthly low for the first time this year.

In the Alluvial Basins region, ground-water levels were generally above last month's levels in Texas; below last month's in California, Nevada, Oregon, and Utah; and mixed with respect to last month's levels in Arizona and New Mexico. Levels were below long-term averages except in the Oregon well, one well in New Mexico, and two wells in Nevada, which were above average. Monthly lows occurred in wells in California, Nevada, and New Mexico. A monthly high occurred in a well in Oregon (for the eighth consecutive month).

In the Columbia Lava Plateau region, water levels were mixed with respect to last month's, but below long-term averages throughout the region. New all-time lows occurred in the Snake River Plain aquifer wells near Atomic City, Idaho (for the fifth consecutive month), and Gooding, Idaho (for the fifth time this year). Monthly lows occurred in one well in Oregon (for the eighth consecutive month) and three other wells in Idaho: the shallow alluvium aquifer well near Meridian (for the seventh time this year), the Snake River Plain aquifer well near Rupert (for the eighth consecutive month), and the Snake River Plain aquifer well near Eden (for the eighth consecutive month, including three all-time lows).

Ground-water levels in the Colorado Plateau and Wyoming Basin region were mixed with respect to last month's levels and to long-term averages in New Mexico, and above last month's levels and long-term averages in Utah. The Westwater Canyon aquifer well near Grants-Bluewater, New Mexico, registered its fifth consecutive monthly low.

In the High Plains region, ground-water levels were mixed with respect to last month's levels in Oklahoma and below last month's levels elsewhere. Levels were below long-term averages throughout the region. An all-time low occurred in the Ogallala aquifer well near Lubbock, Texas (for the fourth time this year).

Ground-water levels in the Nonglaciated Central region were generally above last month's levels except in Pennsylvania where they were mixed with respect to last month's levels, and in Georgia, Maryland, North Dakota, and Virginia where they were below last month's levels. Water levels were generally above long-term averages except in Kansas and Pennsylvania where levels were mixed with respect to long-term averages, and in the Dakotas where levels were below average. A monthly low (the first this year) occurred in the sand and shale aquifer well at State Game Land 249 in Pennsylvania and a high occurred in the Upper Pennsylvanian aquifer well near Glenville, West Virginia (for the

Provisional data; subject to revision

WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES–MAY 1993

GROUND–WATER REGION Aquifer and Location	Aquifer type and local aquifer pumpage	Depth of well in feet	Water level in feet below land–surface datum	Departure from average in feet	Net change in water level in feet since: Last month	Last year	Year records began	Remarks
WESTERN MOUNTAIN RANGES (1)								
Rathdrum Prairie aquifer near Athol, northern Idaho	●	485	468.5	–7.5	1.2	–5.6	1929	
ALLUVIAL BASINS (2)								
Alluvial valley–fill aquifer in Steptoe Valley, Nevada	□	122	8.29	3.44	–.41	0	1949	
Valley–fill aquifer, Elfrida area near Douglas, Arizona	⊜	124	100.17	–16.11	.75	.93	1947	
Hueco bolson aquifer at El Paso, Texas	●	640	273.43	–19.91	.19	–1.93	1964	
COLUMBIA LAVA PLATEAU (3)								
Snake River Plain aquifer near Eden, Idaho	●	208	133.7	–12.0	...	–5.4	1962	May low
Columbia River basalts aquifer at Pendleton, Oregon	⊜	1,501	226.30	–32.39	–1.77	–.61	1965	May low
COLORADO PLATEAU AND WYOMING BASIN (4)								
Dakota aquifer near Blanding, Utah	□	140	46.35	.42	1.34	4.21	1960	
HIGH PLAINS (5)								
Ogallala aquifer near Colby, Kansas	⊜	175	130.52	–11.23	–.11	1.13	1947	
Southern High Plains aquifer at Lovington, New Mexico	⊜	212	58.03	–4.80	–.13	.95	1971	
NONGLACIATED CENTRAL REGION (6)								
Sentinel Butte aquifer near Dickinson, North Dakota	○	160	21.67	–4.30	–.10	.15	1968	
Sand and gravel Pleistocene aquifer near Valley Center, Kansas	●	54	16.24	1.09	1.46	4.78	1937	
Glacial outwash aquifer near Louisville, Kentucky	⊜	94	18.19	5.75	.10	.17	1945	
Upper Pennsylvanian aquifer in the Central Appalachians Plateau near Glenville, West Virginia	○	25	11.04	5.25	.32	.87	1953	May high
GLACIATED CENTRAL REGION (7)								
Fluvial sand and gravel aquifer, Platte River Valley, near Ashland, Nebraska	●	12	2.00	2.22	–1.16	3.67	1933	
Sheyenne Delta aquifer near Wyndmere, North Dakota	○	40	2.73	.86	.30	4.43	1963	
Pleistocene (glacial drift) aquifer at Princeton, Illinois	⊜	29	6.24	1.39	–.52	.04	1942	
Shallow drift aquifer near Roscommon, Michigan	○	14	3.69	.24	–.20	–.26	1934	
Silurian–Devonian carbonate aquifer near Dola, Ohio	□	51	6.50	.06	–.45	.15	1954	
PIEDMONT AND BLUE RIDGE (8)								
Water–table aquifer in Petersburg Granite, southeastern Piedmont at Colonial Heights, Virginia	○	100	13.53	1.27	–1.15	1.43	1939	
Weathered granite aquifer near Mocksville, North Carolina	○	31	12.58	4.25	–.75	3.06	1981	May high
Surficial aquifer at Griffin, Georgia	○	30	12.08	1.82	–1.84	4.39	1943	
NORTHEAST AND SUPERIOR UPLANDS (9)								
Pleistocene glacial outwash aquifer, at Camp Ripley, near Little Falls, Minnesota	⊜	59	15.35	–2.15	.48	.08	1949	
Glacial outwash sand aquifer at Oxford, Maine	○	39	7.78	–.14	–.62	.10	1980	
Shallow sand aquifer (glacial deposits) at Acton, Massachusetts	●	34	17.59	.28	–.50	.89	1965	
Stratified drift aquifer near Morristown, Vermont	○	50	18.54	–.32	–.77	.25	1966	
ATLANTIC AND GULF COASTAL PLAIN (10)								
Columbia deposits aquifer near Camden, Delaware	○	11	5.61	.54	–.58	2.06	1950	
Memphis sand aquifer near Memphis, Tennessee	■	384	107.65	–16.51	–.69	–.51	1940	May low
Eutaw aquifer at Montgomery, Alabama	■	270	22.8	–1.5	–2.3	.6	1952	
Evangeline aquifer at Houston, Texas	■	1,152	275.16	21.23	.83	8.79	1978	
SOUTHEAST COASTAL PLAIN (11)								
Upper Floridan aquifer on Cockspur Island near Savannah, Georgia	■	348	30.59	–2.59	–1.43	2.92	1956	
Upper Floridan aquifer at Jacksonville, Florida	■	905	–23.0	–4.3	–1.8	1.4	1930	
Biscayne aquifer near Homestead, Florida	○	20	7.44	–.71	–1.26	–.76	1932	

fourth consecutive month). The Equus aquifer well near Halstead, Kansas, and the Minnelusa aquifer well near Tilford, South Dakota, did not register record lows for the first time this year.

Ground-water levels in the Glaciated Central region were generally above last month's in the Dakotas, Kansas, and Minnesota; mixed with respect to last month's levels in Indiana and Illinois; and generally below last month's levels elsewhere in the region. Water levels were generally below long-term averages only in Pennsylvania. Water levels were mixed with respect to long-term averages in Illinois, Indiana, New York, and Ohio and above average in the rest of the region. A monthly low occurred in the Lower Mount Simon aquifer well at Illinois Beach State Park, Illinois (for the eighth consecutive month), and in the sandstone aquifer well at Pocono Mountain Lakes Estate, Pennsylvania (for the first time this year). A monthly high occurred in the Newman terrace deposits aquifer well near Lawrence, Kansas (for the first time this year), and in the Big Sioux aquifer well near Dell Rapids, South Dakota. An all-time high occurred in the Ironton-Galesville aquifer well at Illinois State Beach Park, Illinois (for the sixth consecutive month).

In the Piedmont and Blue Ridge region, ground-water levels were below last month's throughout the region. Levels were below long-term averages in New Jersey, mixed with respect to average in Georgia and Virginia, and generally above long-term averages in Maryland, Pennsylvania, and North Carolina. Monthly highs occurred in the weathered gneiss sapprolite aquifer well at Blantyre, North Carolina (fourth time this year and follows an all-time high in April); in the weathered granite aquifer well near Mocksville, North Carolina (for the seventh time this

NEW EXTREMES DURING MAY AT GROUND–WATER INDEX STATIONS

WRD Station Identification Number	GROUND–WATER REGION Aquifer and Location	Aquifer type and local aquifer pumpage	Depth of well	Years of record	End–of–month water level in feet below land surface datum: Previous May Record: Average	Extreme (year)	May 1993
	LOW WATER LEVELS						
	ALLUVIAL BASINS (2)						
324340104231701	Roswell Basin shallow aquifer at Dayton, New Mexico	●	250	42	92.51	123.12 (1992)	123.24
351051106395301	Basin–fill aquifer at Albuquerque, New Mexico	●	980	10	33.57	37.45 (1992)	37.98
361611115151301	Valley-fill aquifer near Las Vegas, Nevada	■	905	47	35.96	100.28 (1992)	111.97
382444121123301	Mehrten aquifer near Wilton, California	▤	300	7	135.42	139.76 (1992)	139.77
	COLUMBIA LAVA PLATEAU (3)						
423659114111601	Snake River Plain aquifer near Eden, Idaho	●	208	30	121.7	128.9 (1991)	133.7
424053113412801	Snake River Plain aquifer near Rupert, Idaho	●	194	42	152.4	165.2 (1992)	166.2
425635114382302	Snake River Plain aquifer at Gooding, Idaho	○	165	21	139.4	150.2 (1992)	[1]156.9
432700112470801	Snake River Plain aquifer near Atomic City, Idaho	⊜	636	44	585.2	588.8 (1991)	[1]589.9
433852116244801	Shallow alluvium aquifer near Meridian, Idaho	●	32	51	7.5	10.3 (1955)	11.2
453934118491701	Columbia River basalts aquifer at Pendleton, Oregon	⊜	1,501	26	193.91	225.69 (1992)	226.30
	COLORADO PLATEAU AND WYOMING BASIN (4)						
352023107473201	Westwater Canyon aquifer near Grants–Bluewater, New Mexico	⊜	155	37	75.23	81.15 (1991)	82.04
	HIGH PLAINS (5)						
341010102240801	Ogallala aquifer near Lubbock, Texas	●	202	42	58.31	93.80 (1992)	[1]95.89
	NONGLACIATED CENTRAL REGION (6)						
395846077040601	Sand and shale aquifer at State Game Land 249, Pennsylvania	■	100	25	11.94	12.86 (1977)	13.06
	GLACIATED CENTRAL REGION (7)						
410940074583401	Sandstone aquifer at Pocono Mountain Lakes Estate, Pennsylvania	▤	799	12	39.03	59.46 (1992)	59.68
422803087475302	Lower Mount Simon aquifer at Illinois Beach State Park, Illinois	■	2,264	4	202.91	206.00 (1992)	206.90
	NORTHEAST AND SUPERIOR UPLANDS (9)						
441440068182701	Bedrock aquifer at Acadia National Park near Southwest Harbor, Maine	□	175	11	7.77	8.20 (1985)	8.27
	ATLANTIC AND GULF COASTAL PLAIN (10)						
303108087162301	Sand and gravel aquifer at Ensley, Florida	□	239	53	74.11	83.00 (1992)	84.76
321357092341701	Sparta aquifer near Ruston, Louisiana	▤	763	49	224.23	237.62 (1992)	238.75
344607091543401	Mississippi Valley alluvial aquifer near Lonoke, Arkansas	●	135	25	108.92	119.12 (1991)	119.39
350900089482300	Memphis sand aquifer near Memphis, Tennessee	■	384	52	91.14	107.14 (1992)	107.65
395524074502501	Upper Potomac-Raritan-Magothy aquifer system near Medford, New Jersey	■	410	16	115.56	136.41 (1992)	136.58
	HIGH WATER LEVELS						
	ALLUVIAL BASINS (2)						
452938122254801	Troutdale aquifer near Portland, Oregon	●	715	29	99.36	87.86 (1991)	87.54
	NONGLACIATED CENTRAL REGION (6)						
385604080495901	Upper Pennsylvanian aquifer near Glenville, West Virginia	○	25	39	16.29	11.91 (1993)	11.04
	GLACIATED CENTRAL REGION (7)						
390006095132301	Newman terrace deposits aquifer near Lawrence, Kansas	⊜	53	42	20.70	15.41 (1987)	14.80
422803087475304	Ironton–Galesville aquifer at Illinois Beach State Park, Illinois	■	1,203	4	232.61	230.48 (1991)	[2]223.58
435145096400501	Big Sioux aquifer near Dell Rapids, South Dakota	⊜	...	15	2.92	–.41 (1984)	–.43
	PIEDMONT AND BLUE RIDGE (8)						
351808082374302	Weathered gneiss sapprolite aquifer at Blantyre, North Carolina	○	58	11	30.00	24.15 (1983)	[2]23.86
355359080331701	Weathered granite aquifer near Mocksville, North Carolina	○	31	11	16.83	13.19 (1991)	12.58
380217078133701	Water table aquiver at Thelma near Boswells Tavern, Virginia	○	56	40	22.08	15.85 (1990)	15.06

[1] All–time month–end low.

[2] All–time month–end high.

year including two all-time highs); and in the water table aquifer well at Thelma near Boswells Tavern, Virginia (the third time this year).

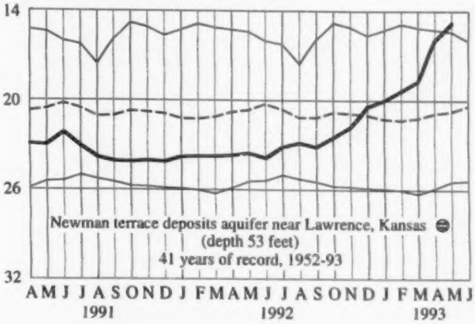
In the Northeast and Superior Uplands region, ground-water levels were generally above last month's levels in Michigan and Minnesota; below last month's levels in Massachusetts, New York, and Vermont; and mixed with respect to last month's levels in Maine and New Hampshire. Levels were mixed with respect to long-term averages in Vermont, below average in Maine, Minnesota, and New Hampshire; and above average in Massachusetts, Michigan, and New York. A monthly low occurred in the bedrock aquifer well at Acadia National Park near Southwest Harbor, Maine (the first low this year and follows an all-time high in April). Connecticut data were missing for May.

In the Atlantic and Gulf Coastal Plain region, water levels were above last month's in Arkansas, Massachusetts, and Texas; mixed in New Jersey and Virginia; and generally below last month's elsewhere. Levels were above long-term averages in Delaware, Georgia, Massachusetts, Texas, and Kentucky; mixed with respect to long-term averages in New Jersey and South Carolina; and below average elsewhere. Monthly lows occurred in wells in the Sparta aquifer near Ruston, Louisiana (for the eighth consecutive month); sand and gravel aquifer at Ensley, Florida (for the eighth consecutive month); Upper Potomac aquifer near Toana, Virginia (for the eighth consecutive month); Mississippi Valley alluvial aquifer near Lonoke, Arkansas (for the second time this year); Memphis sand aquifer near Memphis, Tennessee (for the third consecutive month); and Upper Potomac-Raritan-Magothy aquifer system near Medford, New Jersey (for the first time this year).

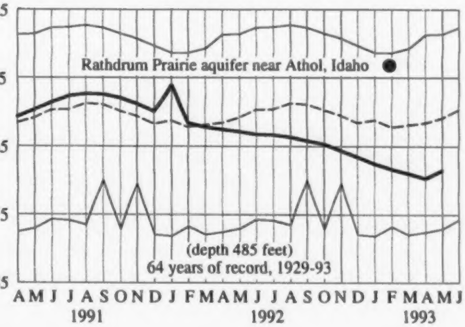
Throughout the Southeast Coastal Plain region, levels were below last month's levels and mixed with respect to long-term averages.

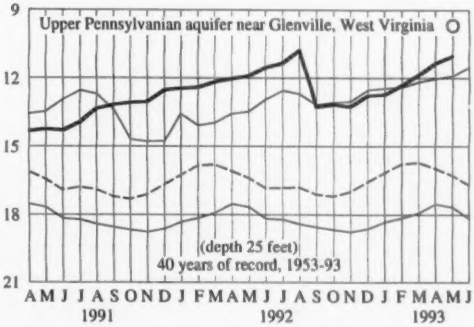
MONTHEND GROUND-WATER LEVELS IN SELECTED WELLS

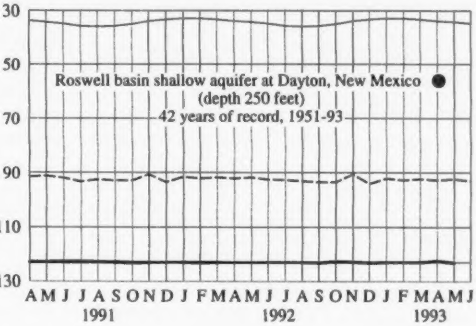
Area between light-weight solid lines indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.

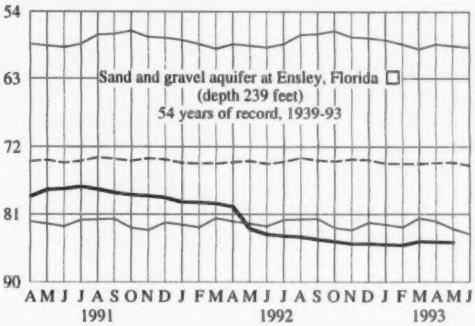


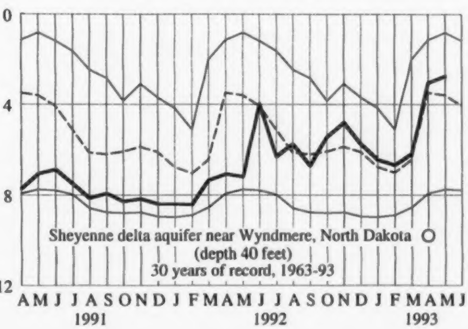
WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM

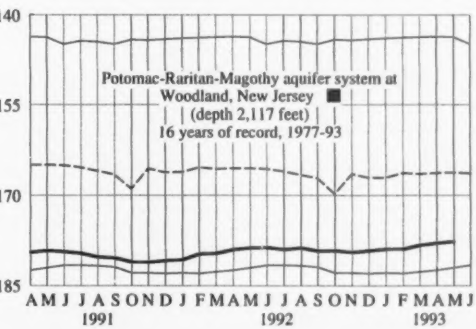




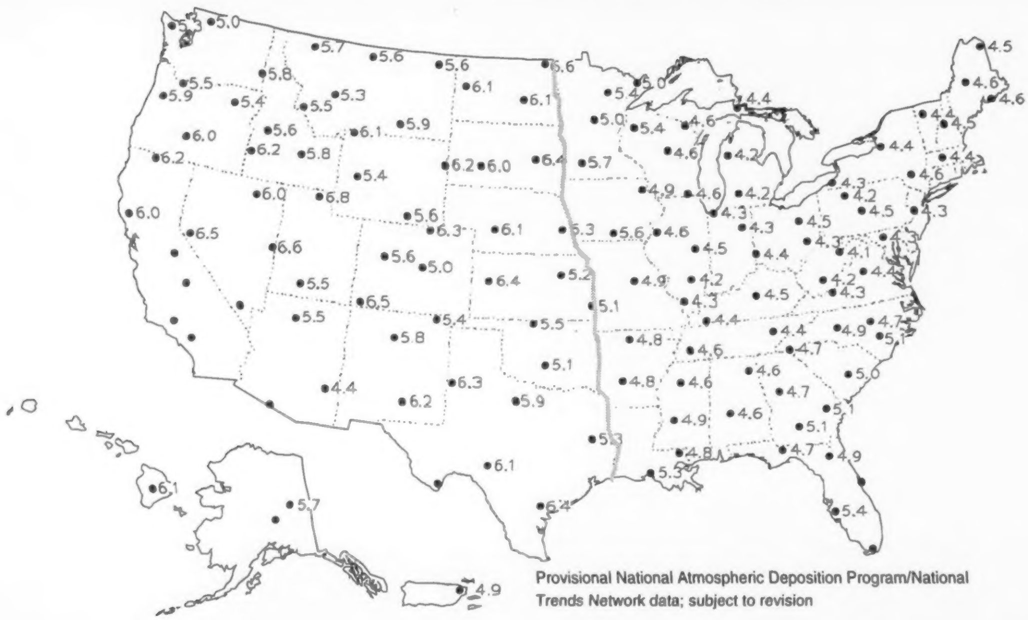








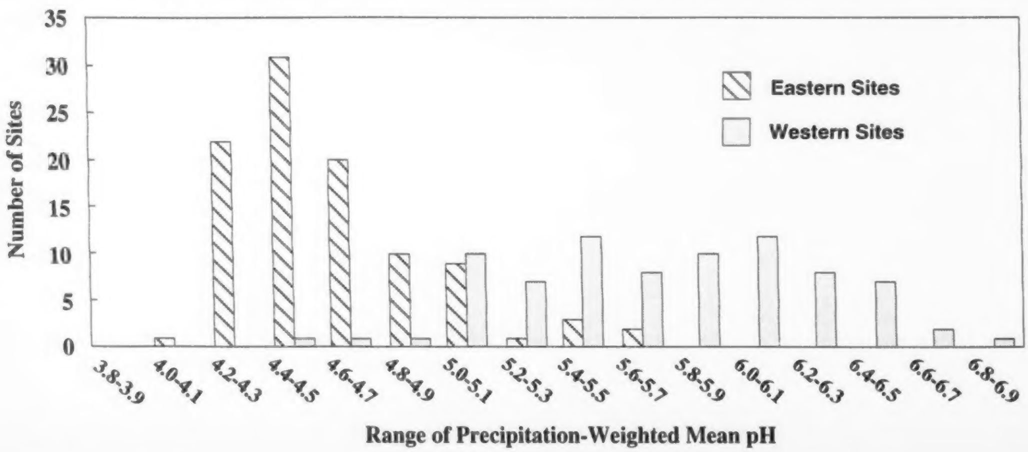
pH of Precipitation for April 26-May 23, 1993



Current pH data shown on the map (• 4.9) are precipitation-weighted means calculated from preliminary laboratory results provided by the NADP/NTN Central Analytical Laboratory at the Illinois State Water Survey and are subject to change. The 128 points (•) shown on this map represent a subset of all sites chosen to provide relatively even geographic spacing. Absence of a pH value at a site indicates either that there was no precipitation or that data for the site did not meet preliminary screening criteria for this provisional report.

A list of the approximately 200 sites comprising the total Network and additional data for the sites are available from the NADP/NTN Coordination Office, Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO 80523.

Distribution of precipitation-weighted mean pH for all NADP/NTN sites having one or more weekly samples for April 26-May 23, 1993. The East/West dividing line is at the western borders of Minnesota, Iowa, Missouri, Arkansas, and Louisiana.



NATIONAL WATER CONDITIONS

MAY 1993

Based on reports from the Canadian and U.S. Field offices; completed March 16, 1994

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Page showing pH of precipitation data furnished by Office of Atmospheric Deposition.

The *National Water Conditions* is published monthly. Subscriptions are free on application to the U.S. Geological Survey, 419 National Center, Reston, VA 22092.

EXPLANATION OF DATA (Revised September 1993)

Cover map shows generalized pattern of streamflow for the month based on provisional data from 186 index gaging stations—18 in Canada, 166 in the United States, and 2 in the Commonwealth of Puerto Rico. Alaska, Hawaii, and Puerto Rico inset maps show streamflow only at the index gaging stations that are located near the point shown by the arrows. Classifications on map are based on comparison of streamflow for the current month at each index station with the flow for the same month in the 30-year reference period, 1961-90. Shorter reference periods are used for one index station in Utah and both of the Puerto Rico index stations. Streamflow data presented herein are those published in the annual series of U.S. Geological Survey reports titled *Water Resources Data* (State) through the end of the 1992 water year—September 30, 1992. All other data are provisional.

The ***streamflow ranges map*** shows where streamflow has persisted in the above- or below-normal range from last month to this month and also where streamflow is in the above- or below-normal range this month after being in a different range last month. Three ***pie charts*** show the percent of stations reporting discharges in each flow range for both the conterminous United States and southern Canada, and also the percent of area in each flow range for the conterminous United States and southern Canada. The ***combination bar/line graph*** shows the monthly percent departure of the total mean from the total median flow (1961-90) and the cumulative monthly departure from median for all reporting stations (excluding seven large river stations indicated by # in the ***Flow of large rivers*** table and French Broad River near Newport, Tennessee) in the conterminous United States and southern Canada. Graphs for individual hydrologic basins exclude the same stations.

The comparative data are obtained by ranking the 30 flows for each month of the reference period in order of decreasing magnitude—the highest flow is given a ranking of 1 and the lowest flow is given a ranking of 30. Quartiles (25-percent points) are computed by weighted averaging of the 7th and 8th highest flows (upper quartile), 15th and 16th highest flows (middle quartile or median), and the 23rd and 24th highest flows (lower quartile). The upper and lower quartiles set off the highest and lowest 25 percent of flows, respectively, for the reference period. The median (middle quartile) is the middle value by definition. For the reference period, 50 percent of the flows are greater than the median, 50 percent are less than the median, 50 percent are between the upper and lower quartiles (in the normal range), 25 percent are greater than the upper quartile (above normal), and 25 percent are less than the lower quartile (below normal). Flow for the current month is then classified as: in the ***above-normal range*** if it is greater than the upper quartile, in the ***normal range*** if it is between the upper and lower quartiles, and in the ***below-normal range*** if it is less than the lower quartile. Change in flow from the previous month to the current month is classified as ***seasonal*** if the change is in the same direction as the change in the median. If the change is in the opposite direction of the change in the median, the change is classified as ***contraseasonal***. For example: at a particular index station, the January median is greater than the December median; if flow for the current January increased from December (the previous month), the increase is seasonal; if flow for the current January decreased from December, the decrease is contraseasonal.

Flood frequency analyses define the relation of flood peak magnitude to probability of occurrence or recurrence interval. ***Probability of occurrence*** is the chance that a given flood magnitude will be exceeded in any one year. ***Recurrence interval*** is the reciprocal of probability of occurrence and is the average number of years between occurrences. For example, a flood having a probability of occurrence of 0.01 (1 percent) has a recurrence interval of 100 years. ***Recurrence intervals imply no regularity of occurrence***; a 100-year flood might be exceeded in consecutive years or it might not be exceeded in a 100-year period.

Statements about ***ground-water levels*** refer to conditions near the end of the month. The water level in each observation well is compared with average level for the end of the month determined from the entire period of record for that well. ***Changes in ground-water levels***, unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved solids and temperature data are given for four stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). ***Dissolved solids*** are minerals dissolved in water and usually consist predominately of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. ***Dissolved-solids discharge*** represents the total daily amount of dissolved minerals carried by the stream. ***Dissolved-solids concentrations*** are generally higher during periods of low streamflow, but the highest dissolved-solids discharges occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at times of low flow.

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

Multiply inch-pound units	By	To obtain SI units
	Length	
inches	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet	3.048×10^{-1}	meters (m)
miles	1.609×10^{3}	kilometers (km)
	Area	
square miles	2.590×10^{0}	square kilometers (km^2)
	Volume	
acre-feet (acre-feet)	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic hectometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{-3}	cubic meters per second (m^3/s)

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